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IS 3840 (2011): Lining Leather [CHD 17: Leather, Tanning Materials and Allied Products]

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“Knowledge is such a treasure which cannot be stolen”



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भारतीय मानक
अस्तर का चमड़ा — विशिष्ट
(तीसरा पुनरीक्षण)

Indian Standard
LINING LEATHER — SPECIFICATION
(Third Revision)

ICS 59.140.30

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

FOREWORD

This Indian Standard (Third Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Leather, Tanning Materials and Allied Products Sectional Committee had been approved by the Chemical Division Council.

This standard was first published in 1966 and subsequently revised in 1979. During the second revision, modifications were made in the requirements of stitch tear strength, water vapour permeability, solvent extractable substance, water soluble matter, water insoluble ash (for aniline or unfinished leather) and bound organic substance to make the standard more reflective of user needs. Further, the use of pentachlorophenol (PCP), as preservative, was prohibited.

Lining leather has a wide range of variety depending on its usage for various purposes. It is made from different types of hides and skins by different processes of tanning and in various thicknesses; as a result the physical and chemical requirements of lining leather also vary to a great extent. Keeping in view this act, in this standard, lining leather has been classified in three different types which broadly cover almost all the types of grain finished lining leather except the one made from leather splits.

In this revision, the requirements of colour fastness to perspiration and limitations in the presence of hazardous chemicals have been introduced. Additionally, the requirement of abrasion resistance has been introduced as an optional requirement and the requirement of solvent extractables has been modified.

The composition of the Committee responsible for formulation of this standard is given in Annex C.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 ‘Rules for rounding off numerical values (*revised*)’. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

LINING LEATHER — SPECIFICATION

(*Third Revision*)

1 SCOPE

This standard prescribes requirements and methods of sampling and test for grain lining leather.

2 REFERENCES

The standards listed below contain provisions which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revisions and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

<i>IS No.</i>	<i>Title</i>
582 : 1970	Methods of chemical testing of leather (<i>first revision</i>)
1640 : 2007	Glossary of terms relating to hides, skin and leather
5868 : 1983	Methods of sampling for leather (<i>first revision</i>)
5914 : 1970	Methods of physical testing of leather
6191 : 1971	Methods of microbiological colour fastness and microscopical tests for leather
14575 : 1999	Determination of pentachlorophenol (PCP) in leather — Method of test
14898 : 2001	Eco criteria for finished leather — Specification

3 TERMINOLOGY

For the purpose of this standard the definitions given in IS 1640 shall apply.

4 TYPES

Lining leather shall be of the following three types:

- a) *Type 1* — Combination tanned lining leather (combination of vegetable and mineral tanning),
- b) *Type 2* — Vegetable tanned lining leather, and
- c) *Type 3* — Full chrome tanned lining leather.

5 REQUIREMENTS

5.1 Raw Material

The material shall be either light weight cow/buffalo hides or goat/sheepskins.

5.2 Tanning

The lining leather shall be prepared by either combination tanning process of vegetable and mineral tanning materials or by vegetable and chrome tanning process.

5.2.1 Fungicidal Additives

At the end of tanning operation and before drying, leather shall be treated with suitable fungicides in requisite proportions.

NOTE — Extreme caution should be exercised since excess dosage of fungicides is harmful and often causes chafing, irritation or dermatitis. To arrive at the optimum dosage of effective and non-toxic fungicides, the method given in LB : 3 of IS 6191 may be followed.

5.2.1.1 Fungicides used to promote mildew resistance in leather shall be effective and non-toxic and shall be as agreed to between the purchaser and the supplier. Preservatives containing pentachlorophenol (PCP) shall not be used and the manufacturer shall give a declaration to this effect along with the consignment.

5.2.1.2 Lining leather shall also pass the fungicidal efficacy test, when tested in accordance with LB : 2 of IS 6191.

5.3 Finishing

The leather shall be grain finished with the flesh side smooth and buffed well. It shall be free from open grub holes, cuts, and open surface blemishes and shall be mellow and yet tight grained.

5.3.1 The leather shall be dyed uniformly and/or finished with pigment subject to agreement between the purchaser and the supplier.

5.4 The material shall comply with the physical requirements given in Table 1.

5.5 The material shall comply with the chemical

requirements given in Table 2.

5.6 Hazardous Chemicals

The leather shall conform to the requirements given in Table 3, when tested in accordance with the methods prescribed in col 4 of Table 3.

5.7 Sizes and Shape

The material shall be supplied in the form of trimmed full pieces and free from toggle, punch and nail marks.

NOTE — Care shall be taken in trimming to ensure a minimum wastage and to obtain a reasonable cutting value out of each piece.

Table 1 Physical Requirements for Lining Leather
(Clause 5.4)

SI No.	Characteristic	Requirement	Methods of Test, Ref to		Annex
			IS 5914 (4)	IS 6191 (5)	
(1)	(2)	(3)	(4)	(5)	(6)
i)	Thickness, mm	As agreed to between the purchaser and the supplier with tolerance of + 0.1	LP : 1	—	—
ii)	Tensile strength, MN/m ² (kgf/cm ²), Min	15 (150)	LP : 6	—	—
iii)	Tongue tear strength, kN/m (kgf/cm) thickness, Min	20 (20)	LP : 6	—	—
iv)	Stitch tear strength (double hole), kN/m (kgf/cm) thickness, Min	44.0 (44.0)	LP : 8	—	—
v)	Colour fastness test for finished leather (contrast grading after 1 024 revolutions), Not worse than:		—	LF : 9	—
a)	Dry rubbing	4	—	—	—
b)	Wet rubbing	3	—	—	—
vi)	Colour fastness to perspiration, grey scale, not worse than	3	—	—	A
vii)	Water vapour permeability, mg/cm ² /h, Min	2	LP : 21	—	—
viii)	Abrasion resistance, Not worse than:				B
a)	25 600 cycles of dry rubs	Moderate abrasion	—	—	—
b)	6 400 cycles of wet rubs	Moderate abrasion	—	—	—

Table 2 Chemical Requirements for Lining Leather
(Clause 5.5)

SI No.	Characteristic	Requirement			Method of Test, Ref to IS 582
		Type 1 (3)	Type 2 (4)	Type 3 (5)	
(1)	(2)	(3)	(4)	(5)	(6)
i)	Solvent extractable substances, percent by mass, Min	3.0	3.0	3.0	LC : 4
ii)	Chromium (as Cr ₂ O ₃), percent by mass, Max	0.75	—	2.50	LC : 10
iii)	Water soluble matter, percent by mass, Max	3.0	10.0	2.0	LC : 6
iv)	Water insoluble ash, percent by mass, Max:				LC : 8
a)	Pigment finished leather	6.0	5.0	7.0	
b)	Aniline or unfinished leather	2.0	2.0	2.0	
v)	pH of water solubles, Min	3.5	4.0	3.5	LC : 18
vi)	Differential member when pH of water soluble is between 3.5 and 4.0, Max	0.7	0.7	0.7	LC : 18
vii)	Bound organic substance, percent by mass	10 to 25	—	10-25	LC : 21
viii)	Degree of tannage, Min	—	45	—	LC : 21
ix)	Hide substance, percent by mass, Min	55	40	55	LC : 5

NOTE — All requirements, except at SI No. (v) and (vi), shall be calculated on zero percent moisture basis.

Table 3 Restriction on Hazardous Chemicals
(Clause 5.6)

SI No.	Characteristic	Requirement	Methods of Test, Ref to
(1)	(2)	(3)	(4)
i)	Formaldehyde, mg/kg, Max	150	LC : 3 of IS 14898
ii)	Pentachlorophenate, mg/kg, Max	5	IS 14575
iii)	Coupled amines released from azo-dyes (sum parameters), mg/kg, Max	30	LC : 4 of IS 14898
iv)	Hexavalent chromium, mg/kg, Max	3	LC : 2 of IS 14898

6 PACKING AND MARKING

6.1 Packing

The leather shall be packed as agreed to between the purchaser and the supplier.

6.2 Marking

Each leather at the tail end of the flesh side shall be marked with its area, in dm, and the type. The packages shall be marked with the following information:

- a) Name of the manufacturer and its recognized trade-mark, if any;
- b) Name of the product and type of leather it contains;
- c) Number of pieces of leather;

- d) Total area and mass; and
- e) Month and year of manufacture.

6.2.1 BIS Certification Marking

The product may also be marked with Standard Mark.

6.2.1.1 The use of the Standard Mark is governed by the provision of *Bureau of Indian Standard Act, 1986* and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

7 SAMPLING AND CRITERIA FOR CONFORMITY

The scale of sampling and criteria for conformity of the material shall be as prescribed in IS 5868.

ANNEX A

(Table 1)

COLOUR FASTNESS TO PERSPIRATION

A-1 GENERAL

This method specifies a method for determining the colour fastness to perspiration of lining leathers.

NOTES

1 During the test, the adjacent fabric used may become stained and the colour of the leather may change.

The method uses an artificial perspiration solution to simulate the action of human perspiration. Since perspiration varies widely from one individual to the next, it is not possible to design a method with universal validity, but the alkaline artificial perspiration solution specified below will give results corresponding to those with natural perspiration in most cases.

2 In general, human perspiration is weakly acidic when freshly produced. Microorganisms then cause it to change, the pH usually becoming weakly alkaline (pH 7.5 to 8.5). Alkaline perspiration has a considerably greater effect on the colour of leather than has acid perspiration. An alkaline, rather than acidic, perspiration solution is therefore used to simulate the most demanding conditions encountered in practice.

A-2 PRINCIPLE

A leather specimen is soaked in artificial perspiration solution and a piece of adjacent fabric, also soaked in artificial perspiration solution, laid against each side to be tested. The composite specimen is left under pressure for a specified time in a suitable apparatus. The leather specimen and adjacent fabric are then dried, and the change in colour of the specimen and the staining of the adjacent fabric assessed with the grey scales. Leathers with a finish may be tested intact or with the finish broken.

A-3 APPARATUS AND MATERIALS

Ordinary laboratory apparatus.

A-3.1 Test Apparatus, capable of subjecting the composite specimen to a uniform pressure of 1.23 N/m² (equivalent to loading with a mass of 125 g/cm²).

NOTE — Commercial sources for apparatus and materials
— Examples of suitable products available commercially are given below. This information is given for the convenience of users of this method and does not constitute an endorsement by BIS of these products.

- a) The recommended apparatus is the 'Hydrotest' (manufactured by, for instance, Karl Schröder KG, D-6940 Weinheim, Germany), which consists of a stainless-steel frame, into which a rectangular piston 4.5 kg in mass and 115 mm × 60 mm in cross-section fits accurately, and rectangular plates of an inert material, for example glass, of the same length and width as the piston and about 1.5 mm thick. Any other apparatus may be used, provided it gives the same results, for example the 'Perspirometer' of the American Association of Textile Chemists and Colourists, supplier: Atlas Electric Devices Co, Chicago, IL, USA.
- b) Examples of suppliers for DW Multifibre fabric:
 - 1) Society of Dyers and Colourists, P.O. Box 244, Bradford, West Yorkshire BD1 2JB, UK, and
 - 2) Testfabrics Inc., P.O. Drawer "O", Middlesex, NJ 08846, USA.

A-3.2 Oven, maintained at $37 \pm 2^\circ\text{C}$.

A-3.3 Plain-Weave Fabric, measuring 100 mm × 36 mm, for use as adjacent fabric.

NOTE — Type DW multifibre fabric is normally used.

A-3.4 Demineralized Water

A-3.5 Artificial Perspiration Solution, containing, per litre, of following solution:

- a) 5.0 g of sodium chloride,
- b) 5.0 g of tris (hydroxymethyl) aminomethane $[\text{NH}_2\text{C}(\text{CH}_2\text{OH})_3]$,
- c) 0.5 g of urea, and
- d) 0.5 g of nitrilotriacetic acid, $[\text{N}(\text{CH}_2\text{COOH})_3]$.

and adjusted to $\text{pH } 8.0 \pm 0.1$ with hydrochloric acid.

To prepare for example 1 litre of alkaline artificial perspiration solution, dissolve the weighed-out components in about 900 ml of demineralized water in a 2 litre beaker with a 1 000 ml mark. Add 2 M hydrochloric acid solution drop by drop while stirring until the pH, measured with a pH-meter, reaches 8.0 ± 0.1 . Make up to 1 000 ml. Check the pH periodically and discard the solution, if the pH is not within 8.0 ± 0.1 . Also discard the solution, if colonies of microbes become visible.

A-3.6 Fine-Grained Abrasive Paper, grade P 180, as defined in the P-series grain size standard published by the Federation of European Producers of Abrasive Products (FEPA).

NOTE — 5 FEPA Standard 43-GB-1984, obtainable from The British Abrasive Federation, P.O. Box 58, Trafford Park Road, Trafford Park, Manchester M17 1 JD, United Kingdom.

A-3.7 Grey Scale for Assessing Staining

A-3.8 Vacuum-Desiccator Vessel, or other glass container suitable for evacuation.

A-3.9 Vacuum Pump, capable of evacuating the desiccator vessel (see A-3.8) to 5 kPa (50 mbar) within 4 min.

A-4 ATMOSPHERE FOR TESTING

The testing atmosphere shall be $27 \pm 2^\circ\text{C}$ and 65 ± 5 percent relative humidity.

A-5 PROCEDURE

A-5.1 If the leather has a finish and is to be tested with the finish broken, prepare the test specimen as follows:

Cut out a piece of leather measuring about 120 mm × 50 mm and lay it out, finish-side down, on a sheet of abrasive paper (see A-3.6) measuring about 150 mm × 200 mm, held flat on a work surface. Load the upper side of the piece of leather uniformly with a 1 kg weight. Move the piece of leather 100 mm to-and-fro on the abrasive paper, carrying out 10 to-and-fro cycles.

NOTE — With practice, the same roughening effect can be achieved holding the abrasive paper in the hand.

Brush the roughened area thoroughly to remove all dust. From the roughened area of the leather, cut out a test specimen measuring 100 mm × 36 mm. The fact that the finish has been broken shall be mentioned in the test report.

A-5.2 If the leather has no finish, or if it has a finish but is to be tested with the finish intact, simply cut out a test specimen measuring 100 mm × 36 mm.

A-5.3 Cut out one or two pieces of adjacent fabric (see A-3.3), also measuring 100 mm × 36 mm.

A-5.4 Immerse the leather specimen and adjacent fabric(s) in artificial perspiration solution (see A-3.5) in separate vessels, using for example bent glass rods to keep them immersed (If testing more than one specimen simultaneously, several pieces of adjacent fabric may be immersed in the same vessel, but each leather specimen shall be immersed in a separate vessel.). Place the vessels in the vacuum desiccator (see A-3.8), produce a vacuum of 5 kPa within 4 min, and hold this vacuum for 2 min. Restore normal pressure. Repeat the procedure a two more times. Lay a piece of adjacent fabric out on a glass plate and cover it with the leather specimen, with the side under test facing down. If both sides are to be tested, cover the leather specimen with a second piece of adjacent fabric. Cover the composite specimen with a second glass plate.

A-5.5 Pre-heat the loading weight of 4.5 kg in the oven (*see A-3.2*) at $37 \pm 2^\circ\text{C}$ for at least 1 h. Place the composite specimen, between the two glass plates, in the test apparatus (*see A-3.1*) and load it with the 4.5 kg weight. In order to allow excess perspiration solution to run off, tilt the apparatus about 30° to each side for a few second (When testing several composite specimens simultaneously, take care to ensure that each is placed centrally between two plates in such a way that the pressure is exerted evenly on it.). Place the loaded apparatus in the oven and leave at $37 \pm 2^\circ\text{C}$ for 3 h.

A-5.6 At the end of the 3 h period, take off the load, remove the composite specimen from the apparatus, stitch it together at one corner, and dry it by hanging it in air under conditions as specified in **A-4**, with the specimen and its adjacent fabric(s) in contact only at the point of stitching.

A-5.7 Assess the staining of each kind of fibre in the adjacent fabric(s), using the appropriate grey

scale, and also assess the change in colour of the specimen.

A-6 TEST REPORT

The test report shall include the following information:

- a) Reference to this method;
- b) Description of the type of leather tested;
- c) An indication as to which surface of the leather was tested;
- d) Whether there was a finish and, if so, whether the finish was broken;
- e) Numerical ratings obtained for the staining of the adjacent fabric(s), giving a separate rating for each of the different types of fibre;
- f) Numerical rating obtained for the change in colour of the specimen; and
- g) Details of any deviations from the procedure.

ANNEX B

(*Table 1*)

DETERMINATION OF ABRASION RESISTANCE

B-1 PRINCIPLE

Circular test pieces are abraded on a reference abradant under known pressure with a cyclic planar motion in a form of a Lissajous figure which is the resultant of two simple harmonic motions at right angles with each other. The resistance to abrasion is assessed by subjecting the test piece to a defined number of cycles at which point it shall not exhibit any holes.

B-2 APPARATUS

B-2.1 Abrasion Machine, fulfilling the following requirements:

- a) Rotational speed of each of the outer pegs 47.5 ± 5 rev/min,
- b) Drive ratio of outer pegs to inner pegs 32 : 30,
- c) Dimensions of the Lissajous figure 60 ± 1 mm,
- d) Symmetry of Lissajous figure curves shall be parallel and evenly spaced,
- e) Face diameter of specimen holder insert 28.65 ± 0.25 mm,

- f) Combined mass of specimen holder, spindle and weight 795 ± 7 g,
- g) Parallelism of plate and abrading tables ± 0.05 mm,
- h) Circumferential parallelism ± 0.05 mm, and
- j) Diameter of abrading base 125 ± 5 mm.

The test piece holders and abrading tables shall be plane and parallel over their entire surfaces. The drive from the motor to the machine shall be connected to a counter and switch so that the revolutions of the outer pegs are inducted and the machine shall be stopped after a predetermined number of cycles has been measured by the counter.

B-2.2 Reference Abradant, consisting of a crossbred worsted spun, plain woven fabric, conforming to Table 4.

The reference abradant shall be mounted on the abrading tables over a piece of felt. The felt shall be woven felt of mass per unit area $750 + 50$ g/m² and 3 ± 0.5 mm thick.

NOTE — The felt need not be renewed until damaged or soiled on both sides or until approximately 100 h of testing have been completed.

Table 4 Reference Abradant
(Clause B-2.2)

S1 No.	Heading	Warp	Weft
(1)	(2)	(3)	(4)
i)	Yarn linear density	R63 tex/2	R74 tex/2
ii)	Threads per cm	17	12
iii)	Singles twist, turns /m	540 ± 20 'Z'	500 ± 20 'Z'
iv)	Two-fold twist, turns/m	450 ± 20 'Z'	350 ± 20 'Z'
v)	Fibre diameter	27.5 ± 2.0	29.0 ± 2.0
vi)	Mass per unit area of fabric, minimum, g/m ²		195
vii)	Oil content, percent		0.9 ± 0.2

B-2.3 Backing for Test Pieces, having a mass per unit area less than 500 g/m², consisting of polyetherurethane foam 3 ± 1 mm thick, of density 30 ± 1 kg/m² and indentation hardness 5.8 ± 0.8 kPa, cut to the same size as the test piece. Backings shall be renewed with every test.

NOTE — Information on the availability of a suitable abrasion machine, reference abradant, felt and polyetherurethane foam may be obtained from the Secretariat of CEN/TC 161.

B-2.4 Fabric Punch or Press Cutter, to produce a test piece to fit the holder, having a diameter of 38 mm.

B-2.5 Weight, of mass 2.5 ± 0.5 kg and diameter 120 ± 10 mm.

B-2.6 Balance, capable of weighing to the nearest 0.001 g.

B-3 ATMOSPHERE FOR TESTING

The testing atmosphere shall be 27 ± 2°C and 65 ± 5 percent relative humidity.

B-4 PREPARATION OF TEST PIECES AND MATERIALS

Using the fabric punch (*see B-2.4*) cut four circular test pieces from the lining, two for the dry test and two for the wet test. Expose the test pieces and materials to the standard atmosphere as indicated at **B-3** for at least 24 h.

B-5 PROCEDURE

B-5.1 General

Check that the top plate and abrading tables are parallel. Insert a diameter gauge through the spindle bearing and move the top plate by turning the drive shaft by hand. The needle movement of the dial gauge shall be within ± 0.05 mm over the whole surface of the abrading table. If machines are being used in which the test piece holders are connected to the weights by spindles, assemble each empty test piece

holder and place each one in position on the appropriate abrading table and insert the spindles. Use a feeler gauge to check for any gap between the face of the holder insert and the table. The gap shall not be greater than 0.05 mm. Rock the spindle from side to side and re-check with the feeler gauge. To avoid damaging abrading tables and metallic inserts, do not run the machine with metallic inserts in contact with the uncovered abrading tables.

B-5.2 Mounting the Test Pieces

Remove the outer ring of a test piece holder together with the accompanying metallic insert. Insert the test piece centrally into the outer ring so that the face to be abraded shows through the hole.

For test pieces of fabric having a mass per unit area less than 500 g/m², insert a disc of polyetherurethane foam (*see B-2.3*) having the same diameter as the test piece. Use a new backing for each test. Place the metallic insert carefully into the outer ring with its raised surface next to the test piece. Complete the assembly of the test piece holder by screwing on the back plate whilst pressing the face of the test piece firmly against a hard surface to prevent wrinkling. Check that no wrinkling has occurred. Repeat for remaining test pieces.

B-5.3 Preparation of Abradant and Backer for Wet Test

Thoroughly wet the fabric abradant and felt backer by one of the following methods:

- a) Soak overnight;
- b) Agitate thoroughly in water; and
- c) Wet with a high pressure water jet.

Allow excessive water to drain and mount them according to **B-5.4**.

Rewet the abradant fabric and felt at 6 400 cycles by gradually pouring on up to 30 ml of water and lightly rubbing it with the fingertips. Place the weight (*see B-2.5*) on the fabric and leave for a few seconds to squeeze out excess water.

B-5.4 Mounting Abradant

Mount a new piece of reference abradant (*see B-2.2*) on each table with a piece of felt of the same dimensions beneath the reference abradant. Flatten the reference abradant by placing the weight (*see B-2.5*) on its surface, and then position and tighten up the retaining frame evenly. Make sure that the reference abradant is held in place firmly and that there are no tucks or ridges.

B-5.5 Mounting Test Piece Holders

Mount the test pieces in the machine.

Every time a holder is taken from the machine to check a test piece, re-tighten the holder before it is replaced on the machine.

If during the test pilling occurs, it shall not be cut off.

B-6 METHOD OF ASSESSMENT

Continue the test until either a hole forms in the test

piece or 25 600 cycles have been performed for the dry sample (6 400 cycles for the wet test). If the fabric has a pile, only holes in the base fabric need to be taken account of. The assessment is done by naked eye.

ANNEX C (Foreword)

COMMITTEE COMPOSITION

Leather, Tanning Materials and Allied Products Sectional Committee, CHD 17

<i>Organization</i>	<i>Representative(s)</i>
Central Leather Research Institute, Chennai	DIRECTOR (Chairman)
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All India Skins & Hide Tanners and Merchants Association, Chennai	SHRI MOHAN M. SREENIVAS SHRI S. MOHAMMED HASSAN (<i>Alternate</i>)
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Bata India Ltd, Bihar	DR SUDHIR KUMAR DAS
Central Footwear Training Institute, Agra	SHRI S. N. GANGULY SHRI S. CHAKRABORTY (<i>Alternate</i>)
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Central Pollution Control Board, Delhi	SHRI T. VENUGOPAL SHRI AJAY AGGARWAL (<i>Alternate</i>)
College of Leather Technology, Kolkata	DR BUDDHADEV CHATTOPADHYAY PROF SWAPAN KUMAR BASU (<i>Alternate</i>)
Consumer Federation of India, New Delhi	REPRESENTATIVE
Council for Leather Exports, Chennai	SHRI M. M. HASHIM DR ZACKRIA SAIT (<i>Alternate</i>)
Directorate General of Quality Assurance (DGQA), Kanpur	SHRI G. C. KANNAUJIA SHRI S. CHAKRABORTY (<i>Alternate</i>)
Footwear Design & Development Institute, Noida	SHRI B. S. KATIYAR SHRI NAVENDU SHEKHAR (<i>Alternate</i>)
Harman Sales Pvt Ltd, Mumbai	SHRI H. K. RAZDAN SHRI JEEVAN RAZDAN (<i>Alternate</i>)
Indian Finished Leather Manufacturers & Exporters Association, Chennai	SHRI SHAFEEQUE AHMED SHRI V. P. NAIMMUR RAHMAN (<i>Alternate I</i>) SHRI M. SALAHUDDIN BARI (<i>Alternate II</i>)
Indian Footwear Component Manufacturers Association, Kolkata	SHRI MANI ALMAL
Indian Leather Products Association, Kolkata	REPRESENTATIVE
Indian Leather Technologists Association, Kolkata	SHRI ARNAB JHA DR GAUTAM MUKHERJEE (<i>Alternate</i>)

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<i>Organization</i>	<i>Representative(s)</i>
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Indofil Chemicals Co Ltd, Mumbai	SHRI S. K. JHA
International Institute of Saddlery Technology and Export Management, Kanpur	REPRESENTATIVE
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